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The ground-based solar observations database BASS 2000

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Abstract. BASS 2000 is the French solar database for ground-based instruments. We describe hereafter our organization, our tasks and the products we can deliver to the international community. Our prospects cover data mining into the THéMIS archive, a participation to the EST endeavour and the creation and curation of the ESPaDOnS/NARVAL stellar spectra database.

1. Organization, tasks and products

BASS 2000¹ is the archive and database of several ground-based solar instruments such as the NRH (Nançay Radio-Heliograph), the *Observatoire de Paris-Meudon* spectroheliograph, the *Pic du Midi* coronograph (HACO, now CLIMSO) and the French-Italian telescope THéMIS installed in Tenerife.

BASS 2000 is located at two different sites. Its main centre is hosted by the *Observatoire Midi-Pyrénées*, and it is situated on the campus of Tarbes about 150 km south-west of the main town of Toulouse. It is the main database and archive of THéMIS. The later archive represents now about 11 To of mostly raw data collected since 1999.

Concerning THéMIS data, it is quite important to recall its data policy here. Indeed, after a PI-ship of one year, *all data become public*. On-line query forms are available to users in order to select data of interest for them. Afterwards we take care of supplying to any user the requested data over the network or using standard media, depending on the requested volume, as quickly as possible.

The BASS 2000 centre at *Observatoire de Paris-Meudon* is mainly in charge of systematic data from other observatories than THéMIS. Daily images of the Meudon spectroheliograph, of the Nançay decametric array and radio-heliograph, and of the *Pic du Midi* coronograph are indeed available here. This centre also provides additional services and tools such as solar ephemeris and reference spectra on-line.

¹<http://bass2000.bagn.obs-mip.fr>



Figure 1. Outlook of the Tarbes archive's web-page of BASS 2000. There is a direct link to some of the reduced date on-line consisting, so far, in vector magnetic field maps.

Finally, a service aka. FROMAGE in charge of computing, upon request, extrapolations of photospheric vector magnetic field maps to the corona is now in operations.

Since 2006, vector magnetic field maps are available on-line, when pointing at the Tarbes archive's web-page (see Fig. 1). For the sake of traceability, users will be gently asked to be identified before accessing to the data. Inversion of data are made using either a PCA-based code (Rees et al. 2000) or a Levenberg-Marquardt code (Bommier et al. 2007).

In 2007, automatic reduction and data transfer procedures have been successfully tested between THéMIS and BASS 2000. This has been done during a 3-week campagn together with HINODE, last fall.

2. Prospects

The experience of the relation between THéMIS, as a data producer, and BASS 2000, its main archive and associated data base is unique in the solar physics community.

On a short/medium-term basis, BASS 2000 will aim at providing the best scientific return from THéMIS data. We shall therefore carry-on *upon request* the backward reduction of MTR (Paletou & Molodij 2001) data taken before 2007, using the standard reduction package *SQUV* provided by the THéMIS group (Sainz Dalda & López Ariste 2007).

Beyond the production of vector magnetic field maps, plans are now for allowing data mining in the large set of second solar spectrum for atomic and molecular lines data, for instance. This is also planned for new solar prominences data taken simultaneously in the visible and near-infrared spectral ranges (see e.g., Léger & Paletou 2008).

The BASS 2000 group is involved in the *European Solar Telescope* design study which will be funded by the European Union's FP7. Our main contribution into the data flow system workpackage will be the survey of the development of Virtual Observatory standards and tools.

Meanwhile the design and the implementation of EST, another evolution of BASS 2000 could be the integration of several other ground-based data coming from other European instruments/telescopes.

Finally, we should open early in 2008 a database for ESPaDOnS² and NARVAL stellar spectropolarimetric data. The first release should deal with $\sim 1\,000$ spectra taken since 2005 both at the CFHT and TBL telescopes mainly on F, G and K-type stars.

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²<http://www.ast.obs-mip.fr/projets/espadons/espadons.html>